



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,780	12/29/2005	Tor Arne Hauge	1935-00174	7961

7590 09/12/2008
Daniel D Fetterley
Suite 1100
100 East Wisconsin Avenue
Milwaukee, WI 53202

EXAMINER

KASTURE, DNYANESH G

ART UNIT	PAPER NUMBER
----------	--------------

3746

MAIL DATE	DELIVERY MODE
-----------	---------------

09/12/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/562,780	Applicant(s) HAUGE, TOR ARNE	
	Examiner DNYANESH KASTURE	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>27 April 2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The preliminary amendment to the claims submitted on 12/29/2005 has been entered, and those are the claims that are being responded to in this office action.

Specification

2. The disclosure is objected to because of the following informalities: Page 8 states that four cylinder assemblies are provided radially OUTSIDE of the oil outlet channel 18. However, the cross section of figures 6 and 7 do not explicitly depict the outline of channel 18, unless the entire opening is the channel and the tie plate and the cog wheel contact the oil being pumped. If that is the case then 18 really is the open space in the interlock section, and an appropriate explanatory statement would make it clear. Appropriate clarification is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. In Re claim 1, the elements "a", "b", "c" and "d" are being improperly relied on to introduce claim limitations regarding opposite piston assembly pairs. Further, the word

Art Unit: 3746

"opposite" lacks a frame of reference, opposite to what ? It is suggested that elements (a, b, c, d) and all other elements in parenthesis be removed from the claim and the following phrases be used instead: first piston assembly, second piston assembly, third piston assembly, fourth piston assembly, a first pair of piston assemblies comprising the first and third piston assemblies, a second pair of piston assemblies comprising the second and fourth piston assemblies. The applicant needs to articulate what is depicted in Figures 6 and 7, without using parenthesis to describe claim limitations. This applies to all the dependant claims as well.

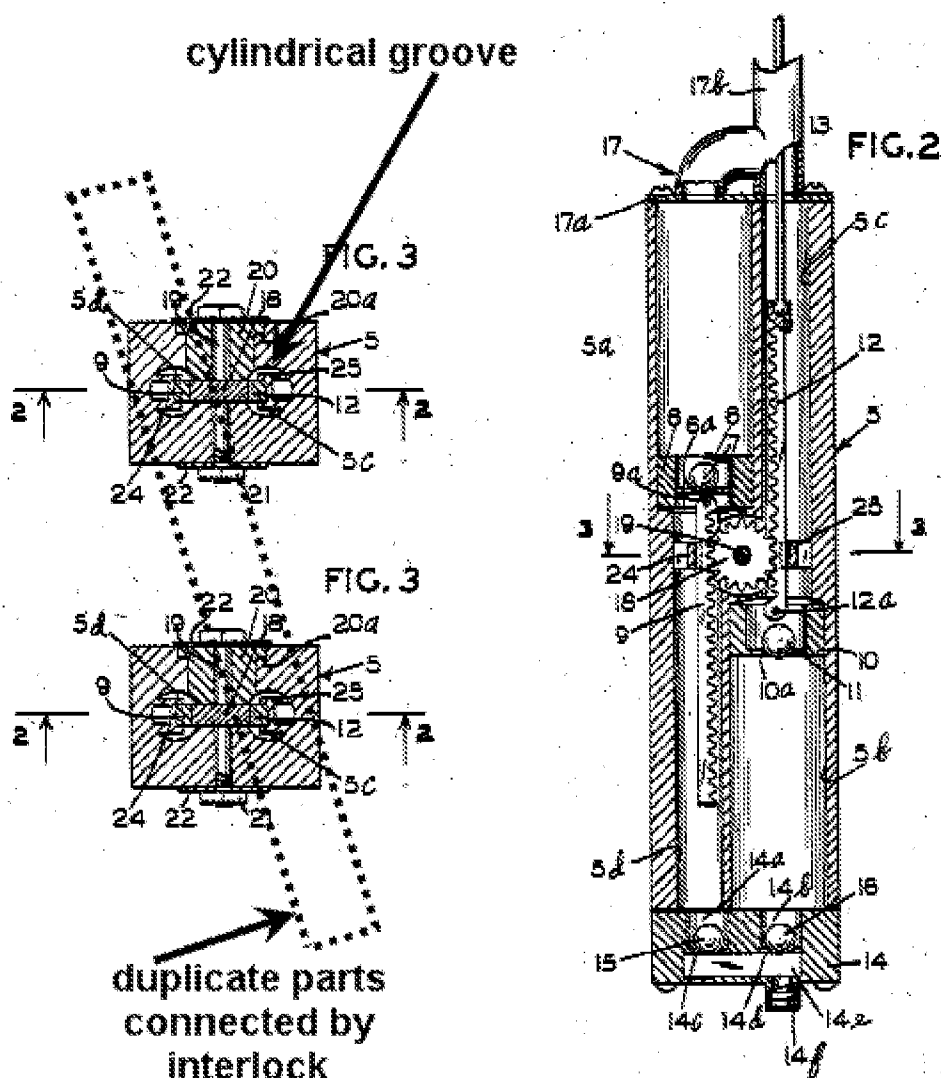
6. In Re claim 2, elements already presented in claim 1 should be referenced "said" element for example "said piston pump includes .."

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibson (US Patent 2,534,436 A) and in view of Millspaugh (US Patent 0,722,240 A)



9. In Re claim 1, with reference to figures 2 and 3 depicted above, Gibson discloses a piston pump (title) for pumping fluid out of a well (W), said pump (2) being connected to control means (B, L, R) and driving means (H) for controlling and driving the pump respectively, when placed in the well, characterized in that the pump has two piston assemblies (6 and 10) that, by means of a cog wheel interlock (18) between said two piston assemblies reciprocate in opposite directions and the piston assembly (6), is

Art Unit: 3746

provided with piston assembly (10) as a pair of piston assemblies where there is always one oncoming piston.

10. However, Gibson does not disclose that there are four piston assemblies with interlock between two of the assemblies and cog wheel interlock associated with the other two assemblies, so that there is always two oncoming pistons.

11. Nevertheless, it has been held that a mere duplication of essential working parts of a device involves only routine skill in the art (MPEP 2144.04 (VI-B)). It would therefore have been obvious to a person having ordinary skill in the art at the time of the invention to duplicate the pump casing (W) with all its parts and connect the drive rods ("R") of both pumps through linkages (interlock) to the same handle (H) so that the pump has four piston assemblies that, by means of a fixed interlock between two opposite piston assemblies (annotated by dotted line in above figures), and by means of a cog wheel interlock between said two piston assemblies and the other two opposite piston assemblies are provided as two oncoming piston assembly pairs.

12. Alternatively, Millspaugh discloses an arrangement of four piston/cylinder assemblies where diametrically opposite pistons are synchronized in suction mode while the other diametrically opposite pistons are in discharge mode (Page 1, Lines 55-65). In addition, Millspaugh discloses and interlock (12) which is described in Page 2, Lines 15-20 as a cross-head that links the driving rods together. Further, Millspaugh discloses that all four pumps are within the same integrated housing.

13. It would have been obvious to a person having ordinary skill in the art at the time of the invention to duplicate the pump casing (W) of Gibson with all its parts and

Art Unit: 3746

connect the drive rods ("R") of both pumps through linkages (interlock) to the same handle (H) so that the pump has four piston assemblies that, by means of a fixed interlock between two diametrically opposite piston assemblies (annotated by dotted line in above figures) as suggested by Millspaugh, and by means of a cog wheel interlock between said two piston assemblies and the other two opposite piston assemblies are provided as two oncoming piston assembly pairs, for the purpose of providing an efficient pump in which all strains and forces will be equalized as stated by Millspaugh on Page 1 lines 55-58.

14. Alternatively, Claims 1 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bostic (US Patent 1,711,582 A) and in view of Millspaugh (US Patent 0,722,240 A)

15. In Re claim 1, Bostic discloses a deep well pump (title), said pump (Figure 1) being connected to control means and driving means (Page 1, Line 105-110, Page 2, Lines 1-2) for controlling and driving the pump respectively, when placed in the well, characterized in that the pump has two piston assemblies (39/45 and 12) that, by means of a cog wheel interlock (37) between said two piston assemblies, reciprocate in opposite directions and the piston assembly (39/45), is provided with piston assembly (12) as a pair of piston assemblies where there is always one oncoming piston.

Art Unit: 3746

16. However, Bostic does not disclose that there are four piston assemblies with interlock between two of the assemblies and cog wheel interlock associated with the other two assemblies, so that there is always two oncoming pistons.

17. Nevertheless, it has been held that a mere duplication of essential working parts of a device involves only routine skill in the art (MPEP 2144.04 (VI-B)). It would therefore have been obvious to a person having ordinary skill in the art at the time of the invention to duplicate the pump casing with all its parts and connect the drive rods (17) of both pumps through linkages (interlock) to the same drive so that the pump has four piston assemblies that, by means of a fixed interlock between two opposite piston assemblies, and by means of a cog wheel interlock between said two piston assemblies and the other two opposite piston assemblies are provided as two oncoming piston assembly pairs.

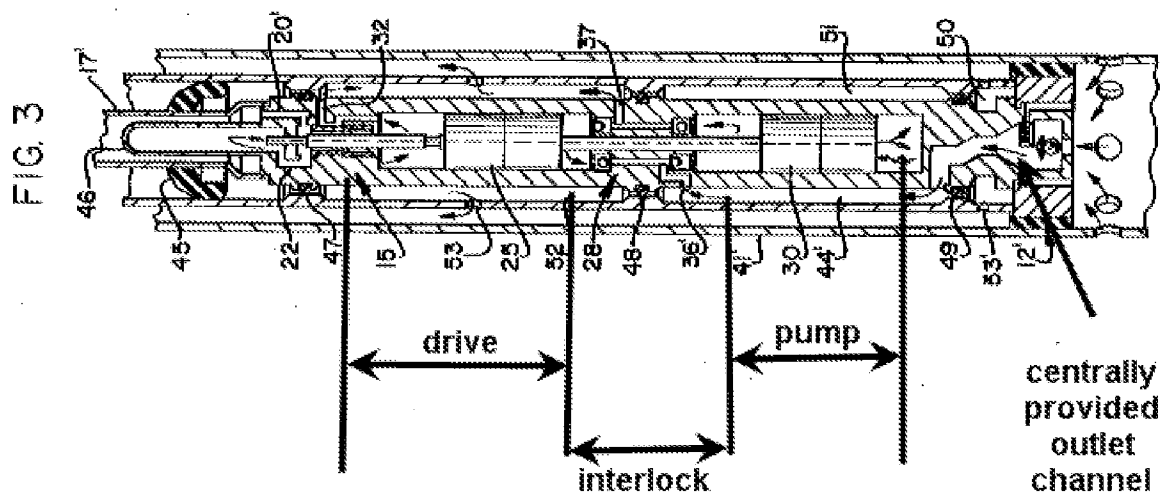
18. Alternatively, Millspaugh discloses an arrangement of four piston/cylinder assemblies where diametrically opposite pistons are synchronized in suction mode while the other diametrically opposite pistons are in discharge mode (Page 1, Lines 55-65). Millspaugh also discloses an interlock and an integrated housing as discussed above.

19. It would have been obvious to a person having ordinary skill in the art at the time of the invention to duplicate the pump casing of Bostic with all its parts and connect the drive rods (17) of both pumps through linkages (interlock) to the same drive so that the pump has four piston assemblies that, by means of a fixed interlock between two diametrically opposite piston assemblies as suggested by Millspaugh, and by means of

Art Unit: 3746

a cog wheel interlock between said two piston assemblies and the other two opposite piston assemblies are provided as two oncoming piston assembly pairs, for the purpose of providing an efficient pump in which all strains and forces will be equalized as stated by Millspaugh on Page 1 lines 55-58.

20. Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibson (US Patent 2,534,436 A) in view of Millspaugh (US Patent 0,722,240 A) and further in view of Roeder (US Patent 4,084,923 A)



21. In Re claim 2, the embodiment in Figure 3 of Roeder discloses a double acting piston pump (title) characterized in that the piston pump includes, in sequence: - a pump cylinder section (annotated); - an interlock section (annotated); and - a drive cylinder section (annotated); all of which are provided with a centrally provided oil outlet channel (annotated);

- wherein the pump cylinder section, the interlock section and the drive cylinder section

Art Unit: 3746

internally are provided with axial cylinder assembly (25, 30) comprising:

- a pump cylinder (chamber of piston 30) in the pump cylinder section;
- a movement region (annotated) in the interlock section (where rod 24 can move); and
- a drive cylinder (chamber of piston 25) in the drive cylinder section;
- wherein the cylinder assembly is internally provided with an axially movable piston assembly (25, 30), each piston assembly comprising:
 - a pump piston (30) in the pump cylinder;
 - a piston rod (24) in the inwardly open movement region; and
 - a drive piston (25) in the drive cylinder.

22. Roeder does not disclose the cog wheel and the remaining limitations of claim 2. Nevertheless, Gibson and Millspaugh as applied to claim 1 discloses four axial cylinder assemblies distributed peripherally, with inwardly open cylindrical grooves as depicted where the cog wheels are located in the inwardly open movement region.

- wherein two diametrically opposite piston rods are mechanically connected by means of a linkage provided between them as discussed earlier;
- wherein each of said two mechanically connected piston rods is movably connected to one of the other two piston rods via a cog wheel provided therebetween as discussed earlier, both of said cog wheels being supported in the interlock section (inwardly open movement region); and wherein each piston rod (24, 25) is provided with a pitch rack portion (9, 12) facing towards said cog wheel (18) and having a length corresponding to at least the stroke length of said pistons.

Art Unit: 3746

23. It would have been obvious to a person having ordinary skill in the art at the time of the invention to further modify each of the four piston/cylinder assemblies of Gibson modified by Millspaugh so that they have a drive section and a pump section with an intermediate interlock section as taught by Roeder, with the assemblies linked by fixed interlock and cog wheel interlock as discussed earlier for the purpose of eliminating the need for hand pumping (Gibson).

24. In Re claim 3, Millspaugh discloses that the four cylinder assemblies are distributed peripherally around a at equal angle distance to each other as depicted.

25. In Re claims 4 and 6, Gibson discloses an inwardly open region with partially cylinder-shaped grooves.

26. In Re claims 5, 7 and 8, Millspaugh discloses that drive shafts are connected together with a tie-plate (12).

Conclusion

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dole et al (US Patent 4,097,199 A) discloses a double acting pump using the rack and pinion arrangement. Montgomery (US Patent 1,420,052 A) discloses another oil well pump using the cog wheel arrangement.

Art Unit: 3746

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DNYANESH KASTURE whose telephone number is (571)270-3928. The examiner can normally be reached on Mon-Fri, 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272 - 7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Charles G Freay/
Primary Examiner, Art Unit 3746

DGK